

Differentials*

SERVICE INFORMATION ON 1936 TO 1939 PASSENGER CARS

On many car models, no drain plug is provided for draining the rear axle (differential) housing. In response to numerous requests for information regarding the draining of rear axles having no drain plugs, a thorough research of manufacturers' instructions and recommendations has been made covering all makes of cars from 1936 to 1939 inclusive. The result of this research work is shown in this article, separately for each year.

In tabulating this information, it will be noted that the method of draining rear axle housings has been divided into 4 different classifications as follows:

- (a) Models provided with drain plugs.
- (b) Models not provided with drain plugs but which have the rear axle housing cover attached with cap screws.
- (c) Models not provided with drain plugs but which have the rear axle housing cover welded in place and the differential carrier attached with cap screws.
- (d) Models not provided with drain plugs but which have the rear axle housing cover welded in place and the differential carrier attached with studs and nuts, the studs themselves being non-removable.

Obviously with models coming under class (a), draining is accomplished by merely removing the drain plug. Models coming under class (b) may be drained by removing a cap screw at the bottom of the rear cover plate. If drained in this manner, quicker results will be obtained if drained while the lubricant is warm (after a long drive). While air pressure may be applied through the differential filler plug hole, caution must be used not to apply too much pressure because some axle designs are such that oil seals may be damaged and grease forced out on the brakes.

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Models coming under class (c) may be drained in the same manner as class (b) except that the lower differential carrier cap screws (on front side of differential case) must be removed. Models coming under class (d) can be drained only by use of a suction gun as the rear housing cover is welded in place and front differential carrier studs cannot be removed. Draining information for the different years is as follows:

INFORMATION FOR DRAINING REAR AXLE HOUSINGS ON ALL PASSENGER CARS 1936 TO 1939 INCLUSIVE

1936 Models—

- (a) Makes and models having a bottom drain plug. Drained by removing plug:
 - Buick (All models)
 - Cadillac (All models)
 - Ford (All models)
 - Graham (All models)

- Hupmobile (All models)
- La Salle
- Lincoln (V-12)
- Lincoln Zephyr
- Nash (Amb. 6 and 8 only)
- Packard (All models)
- Pierce-Arrow (All models)
- Reo (All models)
- Studebaker (All models)

(b) Makes and models having no drain plug but which have the rear axle housing cover attached with cap screws. Drained by removing one or more rear bottom cap screws, or by use of a suction gun through filler plug hole:

- Chevrolet (All models)
- Nash (All models except Amb. 6 and 8)
- Oldsmobile (All models)
- Pontiac (All models)
- Willys

(c) Makes and models having no drain plug but which have the rear axle housing cover welded in place and the differential carrier attached with cap screws. Drained by removing one or more front bottom cap screws, or by use of a suction gun through filler plug hole:

- Chrysler (All models)
- De Soto (All models)
- Dodge (All models)
- Plymouth

(d) Makes and models having no drain plug but which have the rear axle housing cover welded in place and the differential carrier attached with studs and nuts, the studs themselves being non-removable. Drained only by use of a suction gun through filler plug hole:

- Hudson (All models)
- Hudson-Terraplane (All models)

(Continued on page 2)

SPECIAL ANNOUNCEMENT

I am sure it will be of interest to all readers of the Institute Spokesman to learn that the final arrangements have been completed for the Seventh Annual Convention which is to be held in the Stevens Hotel in Chicago, October 2 and 3.

I sincerely hope that plans will be made by all members and readers of the Spokesman to be in attendance. A very interesting program is already being arranged by the Committee in charge.

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Latest Car Manufacturers Recommendations*

The Studebaker Corporation on April 1 announced the addition of a new low-priced 6-cylinder car to their present line. The new car is known as the Champion Model G and is available in both Custom and De Luxe models.

The Planar front suspension is used on this model, although the design is changed somewhat. Transmission overdrive is optional equipment. The gear shift lever is mounted on the steering column. Several lubrication points which are found on the Commander and President models, have been eliminated on the new model. Rear spring bolts and shackles are rubber mounted, and the water pump and fan have packed bearings requiring no further lubrication.

Hudson to Release New Model

A new model, to be known as the Hudson Pacemaker 6, is soon to be released by Hudson Motor Car Company. The "Pacemaker" model name is not entirely new to Hudson, as a Hudson Pacemaker 8 was produced in 1933.

The new model is being brought out to appeal to the spring and summer trade and is to have quite a sporty looking body. It will be identical, insofar as lubrication details are concerned, with the 1939 Hudson 6. Shock Absorbers will be Monroe, telescoping type. Starting Serial No. will be 9132567.

American Bantam 1938-39 Models

These models are correctly listed as Model 60 and are so advertised by the manufacturer. However, for technical purposes, the factory further subdivides these models into:

Early 1938 models—Series 60

Late 1938 and Early 1939 models—Series 62

Late 1939 models—Series 63

The only mechanical change is found in the Series 63, which has full pressure feed of engine oil to the rear main bearings, camshaft bearings, and connecting rod bearings. The Series 60 and 62 have a combination pressure and jet splash feed.

All lubrication recommendations, capacities and other service details are identical for all series.

CADILLAC V-8 (60S) AND V-8 (61) — 1939—A change in the method of lubricating the clutch and brake pedals has recently been made in production on these models. The hubs of both pedals are now being equipped with a pressure gun fitting

through which Chassis Lubricant should be applied every 1,000 miles. These two fittings may be reached from under the car.

Previous to this change in production, the 60S model was originally provided with two oil holes with wicks at this point of lubrication. This was changed to oilless bushings shortly after production started. Model 61 was originally equipped with bearings requiring no lubrication.

The one lubrication fitting used on the clutch equalizer shaft found on models 60S and 61 cannot be easily reached with some types of gun equipment, and a lubrication adapter has been designed to aid in reaching these fittings. One end of the adapter is equipped with a coupling which fits onto all power and hand operated guns; the other end snaps onto the lubrication fitting on the shaft. The fitting is best reached from under the car although it may be reached from under the hood, but with a little more difficulty.

CADILLAC V-8 (60)—1937-38; (60S)—1938-39—To lubricate the front wheel bearings on these models, remove wheel hub after removing steel band which is clamped on brake drum shield, clean and repack bearings and replace wheel hub and drum band.

FORD V-8 (60, 85) AND DE LUXE—1939—The gas tank capacity on these models is 15 gal. instead of 14 gal. as given in original information from the factory.

HUDSON 6, 8—1939—All 1939 Hudson models, with the exception of the Country Club 6 are equipped with Monroe, telescoping type shock absorbers; the Country Club 6 has Delco, telescoping type.

LA SALLE V-8 (50)—1939—A change has recently been made in production in the method of lubricating the clutch and brake pedals. The hubs of both pedals are now being equipped with a pressure gun fitting through which Chassis Lubricant should be applied every 1,000 miles. These two fittings may be reached from under the car. Originally these pedals were equipped with bearings requiring no lubrication.

A clutch equalizer shaft is also used on the 1939 La Salle V-8 (50). Lubrication with Chassis Lubricant through a fitting is required every 1,000 miles. This fitting cannot be easily reached with some types of gun equipment and a lubrication adapter has been designed to aid in reaching these fittings. One end of the adapter is equipped with a coupling which fits onto all power and hand operated guns; the other end snaps onto the lubrication fitting on the shaft.

(Continued from page 1)

1937 Models—

(a) Makes and Models having a bottom drain plug. Drain by removing plug:

Cadillac (All models)
Ford (All models)
Graham (All models)
Hupmobile (All models)
La Salle
Lincoln (V-12)
Lincoln Zephyr
Nash (Amb. 8 only)
Packard (All models)
Pierce-Arrow (All models)
Studebaker (All models)

(b) Makes and models having no drain plug but which have the rear axle housing cover attached with cap screws. Drained by removing one or more rear bottom cap screws, or by use of a suction gun through filler plug hole:

Buick (All models)
Chevrolet (All models)
Nash (All models except Amb. 8)
Oldsmobile (All models)
Pontiac (All models)
Willys

(c) Makes and models having no drain plug but which have the rear axle housing cover welded in place and the differential carrier attached with cap screws. Drained by removing one or more front bottom cap screws, or by use of a suction gun through filler plug hole:

Chrysler (All models)
De Soto (All models)
Dodge (All models)
Plymouth (All models)

(d) Makes and models having no drain plug but which have the rear axle housing cover welded in place and the differential carrier attached with studs and nuts, the studs themselves being non-removable. Drained only by use of a suction gun through filler plug hole:

Hudson (All models)
Hudson-Terraplane (All models)

1938 Models—

(a) Makes and models having a bottom drain plug. Drained by removing plug:

American Bantam
Cadillac (All models)
Ford (All models)
Graham (All models)
Hupmobile (All models)
La Salle
Lincoln (V-12)
Lincoln Zephyr
Nash (Amb. 8 only)
Packard (All models)—
plug at bottom front
Pierce-Arrow (All models)
Studebaker (All models)

(Continued on page 3)

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(Continued from page 2)

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Buick (All models)
Chevrolet (All models)
Nash (All models except Amb. 8)
Oldsmobile (All models)
Pontiac (All models)
Willys

(c) Makes and models having no drain plug but which have the rear axle housing cover welded in place and the differential carrier attached with *cap screws*. Drained by removing one or more front bottom cap screws, or by use of a suction gun through filler plug hole:

Chrysler (All models)
Dodge (All models)
De Soto (All models)
Plymouth (All models)

(d) Makes and models having no drain plug but which have the rear axle housing cover welded in place and the differential carrier attached with studs and nuts, the studs themselves being non-removable. Drained only by use of a suction gun through filler plug hole:

Hudson (All models)
Hudson-Terraplane (All models)

1939 Models—

(a) Makes and models having a bottom drain plug. Drained by removing plug:

American Bantam
Cadillac (All models)
Ford (All models)
Graham (All models)
Hupmobile (All models)
La Salle
Lincoln (V-12)
Lincoln Zephyr
Nash (Amb. 8 only)
Packard (All models)—
plug at bottom front
Studebaker (All models)

(Continued on page 4)

Technical Data*

Following is a method developed by the Timken Bearing Company, Canton, O., for separation of Mineral Oil from Greases and is published for your information and comment.

Separation of Mineral Oil from Greases

Lime, soda and mixed base greases are handled the same way.

Place the chosen amount of grease (approximately $\frac{1}{2}$ pound) in a suitable vessel, (we use a litre beaker), boil and agitate with 1-1 hydrochloric acid until all soap is decomposed. Syphon off the acid and wash once or twice with hot distilled water. Add an excess of a saturated solution of caustic and fill container with boiling distilled water, allow to settle a few minutes until oil comes to the top. Syphon off the soap solution. Wash several times with hot dis-

tilled water, until the soap is removed and the water is clear. Add hot 1-1 hydrochloric acid and wash once or twice with boiling distilled water.

When refined oils are used in the greases, heating the separated oil from above to 225-250°F. will remove last trace of water, after which the physical properties of the oil may be obtained.

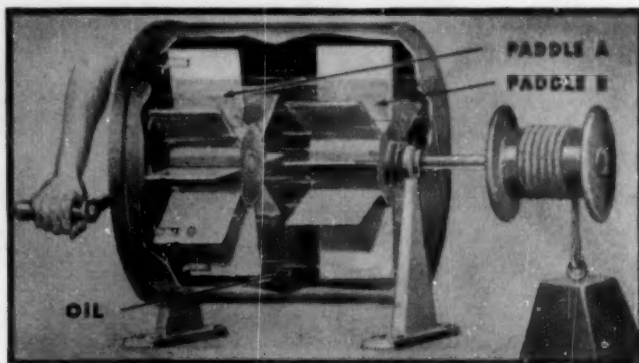
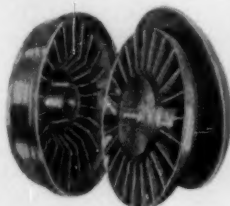
When black unrefined oils are used it is at times necessary to dilute the oil, after the final acid and wash treatment, with ether to get the water to drop out. The ether is then distilled off and the physical properties of the oil determined.

Chrysler Fluid Drive*

Mention of Chrysler's fluid drive brought a barrage of questions—"How does it work?" "What are the advantages?" "Don't you have to shift gears?" "What

attention does it require?" These are but a few, but they are representative.

Because the "Fluid Drive," offered by Chrysler on their Custom Imperial, repre-



sents a revolutionary change, a departure that indicates a new trend, it's an interesting subject—one that you will want to be able to discuss intelligently with your customers who ask questions.

A simple illustration of the principle involved may be obtained by facing two electric fans several inches apart. If one fan is turned on, air will rush by the blades of the other fan, propelling it although there is no direct connection of any kind. The fluid drive is thus similar to a cylindrical drum, partially filled with liquid, and enclosing two paddle wheels mounted on independent shafts. If one paddle wheel is turned (A), the fluid will agitate the other (B), causing it to turn also.

The Chrysler fluid drive consists of an impeller with 22 vanes (or paddles), a runner with 24 vanes and a cover welded to the unit. The coupling is self-lubricated and needs no attention beyond keeping the fluid

at correct level. Location of the small filler hole makes it impossible to over-fill the unit, permits filling only to 80% capacity. For the present, customers requiring this service should be directed to the nearest Chrysler dealer.

The complete coupling is attached and revolves with the crankshaft. Thus, power is transmitted from the engine to the rear wheels entirely through fluid in the coupling. An auxiliary friction clutch and transmission is attached for backing, maximum acceleration from a standing start, for climbing an exceptionally steep grade or pulling the car out of a ditch.

Advantages claimed for the fluid drive are many. Smooth operation and flexibility heretofore available only in steam and electric vehicles—the car may be started from standstill, operated in normal traffic and stopped without use of the clutch. Engine and drive-shaft vibration are eliminated.

* Courtesy The Sohio Sales Engineer

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(Continued from page 3)

(b) Makes and models having no drain plug but which have the rear axle housing cover attached with *cap screws*. Drained by removing one or more rear bottom cap screws, or by use of a suction gun through filler plug hole:

Buick (All models)
Chevrolet (All models)
Nash (All models except Amb. 8)
Oldsmobile (All models)
Overland
Pontiac (All models)
Willys

(c) Makes and models having no drain plug but which have the rear axle housing cover welded in place and the differential carrier attached with cap screws. Drained by removing one or more front bottom cap screws, or by use of a suction gun through filler plug hole:

Chrysler (All models)
Dodge (All models)
De Soto (All models)
Plymouth (All models)

(d) Makes and models having no drain plug but which have the rear axle housing cover welded in place and the differential carrier attached with *studs* and nuts, the studs themselves being non-removable. Drained only by use of a suction gun through filler plug hole:

Hudson (All models)

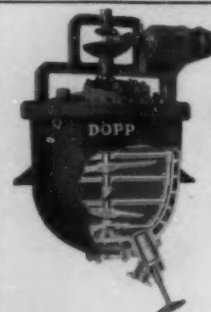
Proper Lubricant Necessary

In general, the lubricants recommended by the car manufacturers fall under two general classifications: Hypoid Gear Lubricant where Hypoid gears are used and straight Mineral Oil Gear Lubricant or Mild Extreme Pressure Gear Lubricant where Spiral Bevel gears are used. However, some manufacturers recommend Hypoid Gear Lubricant for Spiral Bevel gears.

During the past two years manufacturers have been cautioning against the mixing of Hypoid Gear Lubricants made by different oil companies, as there is a possibility that certain chemical changes may result in an entirely dissimilar lubricant that might cause damage to bearings and gears. While some manufacturers continue to caution against mixing brands of Hypoid Lubricants, others have lifted this restriction.

Cleaning and Flushing

When the differential lubricant is changed, it is necessary that the differential case be flushed and thoroughly cleaned. Where Hypoid Lubricant is used, do not flush with gasoline, kerosene or steam—use only "flushing" oils.



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